

Curriculum Vitae

RICHARD JOHN ROBERTS

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PERSONAL: Born on September 6, 1943, Derby, England

EDUCATION: 1962-1965 University of Sheffield, Sheffield, England
B.Sc. in Chemistry
1966-1968 University of Sheffield, Sheffield, England
Ph.D. in Organic Chemistry

POSITIONS: 1992- Research Director, New England Biolabs
1986-92 Assistant Director for Research, Cold Spring Harbor Laboratory
1972-86 Senior Staff Investigator, Cold Spring Harbor Laboratory
1971-1972 Research Associate in Biochemistry, Harvard University
1969-1970 Research Fellow, Harvard University

OUTSIDE ACTIVITIES:

1974-1992	Consultant and Chairman of Scientific Advisory Board New England Biolabs
1977-1985	Scientific Advisory Board, Genex Corp.
1977-1987	Editorial Board: Nucleic Acids Research
1979-1984	Editorial Board: Journal of Biological Chemistry
1982-1989	Member: National Advisory Committee of GENBANK
1984-1986	Member: National Advisory Committee of BIONET
1985-1988	Panel member: NIH Study Section in Biochemistry.
1985-	Editorial Board: Bioinformatics (formerly CABIOS)
1987-1990	Chairman: National Advisory Committee of BIONET
1987-	Executive Editor: Nucleic Acids Research
1990-1992	Panel member: NCI Cancer Centers Support Grant Review Committee
1993-1995	Panel member: NLM Study Section/Comp. Biol.
1994-2000	Scientific Advisory Board, Molecular Tool
1994-	Patron of the Oxford International Biomedical Center
1996-1998	Visiting Professor, University of Bath, UK.
1996-2000	Chairman, NCI Board of Scientific Counselors
1996-1999	Scientific Advisory Board, Oxford Molecular Group
1997-	Editorial Board: Curr. Opin. Chem. Biol.
1998-	Sci. Advisory Board, Conservation Law Foundation
1998-	Chairman, Scientific Advisory Board, Celera
1998-	Chairman, Scientific Advisory Board, MultiGene Biotech
1998-	Board Member, Albert Schweitzer Academy of Medicine
1998-2001	Chairman, Steering Committee on Genetics and

2000-	Biotechnology, ICSU
2000-	Scientific Advisory Board, PubMed Central
	Scientific Advisory Board, Orchid Biosciences

RESEARCH INTERESTS:

Restriction endonucleases, DNA methylases,
computational molecular biology.

SOCIETY MEMBERSHIPS AND AWARDS:

American Society of Biological Chemistry
 American Chemical Society
 American Society for Microbiology
 American Association for the Advancement of Science
 HUGO
 John Simon Guggenheim Fellow (1979-1980)
 ASM Foundation Lecturer (1988-1989)
 Miller Professor at UC Berkeley (1991)
 Honorary Doctor of Medicine, University of Uppsala (1992)
 Nobel Prize in Physiology or Medicine (1993)
 Bourke Lecturer, Boston University (1994)
 Dakin Lecturer, Adelphi University (1994)
 Golden Plate Award, American Academy of Achievement (1994)
 Honorary Doctor of Medicine, Bath University (1994)
 Honorary Doctor of Science, Sheffield University (1994)
 Convocation Award, Sheffield University (1994)
 Faye Robiner Award, Ross University (1994)
 Fellow of the Royal Society (1995)
 Honorary Doctor of Science, Derby University (1995)
 Fellow of the Royal Society (1995)
 Associate Member of EMBO (1995)
 Foreign Fellow, Nat'l Academy of Medical Sciences, Pakistan (1996)
 Ada Doisy Lecturer, Univ. Illinois, Urbana (1996)
 Wei Lun Visiting Professor, Chinese University, Hong Kong (1996)
 William Ferdinand Memorial Lecturer, Sheffield University (1997)
 Proctor & Gamble Distinguished Lecturer, Purdue University (1997)
 Fellow of the American Society of Arts and Sciences (1997)
 Fellow of the American Academy of Microbiology (1997)
 Steinberg/Wylie Lecture, University of Maryland (1997)
 Knudson Lecture, Oregon State University (1997)
 Medicus Magnus of the Polish Academy of Medicine (1998)
 Robert Church Lecture in Biotechnology, Univ. Calgary (1998)
 Albert Einstein Memorial Lecturer, Princeton (2000)

PUBLICATIONS:

1. Gregson, M., Kurosawa, K., Ollis, W.D., Redman, B.T., Roberts, R.J. and Sutherland, I.O. The natural occurrence of cis- and trans-cinnamylphenols. *Chemical Communications* **22**: 1390-1392 (1968).

2. Ollis, W.D., Redman, B.T., Roberts, R.J. and Sutherland, I.O. New neoflavanoids from *Machaerium kuhlmannii* and *Machaerium nictitans* and the recognition of a new neoflavanoid type, the neoflavenes. *Chemical Communications* **22**: 1392-1393 (1968).
3. Mageswaran, S., Ollis, W.D., Roberts, R.J. and Sutherland, I.O. Biogenetic models for the formation of natural cinnamylphenols and neoflavanoids. *Tetrahedron Letters* **34**: 2897-2900 (1969).
4. Ollis, W.D., Ormand, K.L., Redman, B.T., Roberts, R.J. and Sutherland, I.O. The oxidative rearrangement of olefins by thallium (III) acetate. Part II. Synthesis of isoflavones. *J. Chem. Soc. (C)*, 125-128 (1970).
5. Gottlieb, O.R., Mageswaran, S., Ollis, W.D., Roberts, R.J. and Sutherland, I.O. Recent developments in neoflavanoid chemistry. *Ann. Acad. Brasil. Cienc.* **42**: 417-423 (1970) suplemento.
6. Stewart, T.S., Roberts, R.J. and Strominger, J.L. Novel species of tRNA. *Nature* **230**: 36-38 (1971).
7. Lovinger, G.G. and Roberts, R.J. A comparison of two glycyl-tRNAs from *Staphylococcus epidermidis*. *Fed. Proc.* **30**: 1217 (1971).
8. Roberts, R.J. Comparative studies of the staphylococcal glycyl-tRNAs which are non-functional in protein synthesis. *Fed. Proc.* **31**: 422 (1972).
9. Roberts, R.J. Structures of two glycyl-tRNAs from *Staphylococcus epidermidis*. *Nature New Biol.* **237**: 44-45 (1972).
10. Linnett, P.E., Roberts, R.J. and Strominger, J.L. Biosynthesis and cross-linking of the gamma-glutamyl glycine containing peptidoglycan of vegetative cells of *Sporosarcina ureae*. *J. Biol. Chem.* **249**: 2497-2506 (1974).
11. Allet, B., Roberts, R.J., Gesteland, R.F. and Solem, R. Class of promoter sites for *Escherichia coli* DNA-dependent RNA polymerase. *Nature* **249**: 217-221 (1974).
12. Roberts, R.J., Lovinger, G.G., Tamura, T. and Strominger, J.L. Staphylococcal transfer ribonucleic acids. I. Isolation and purification of the isoaccepting glycine transfer ribonucleic acids from *Staphylococcus epidermidis* Texas 26. *J. Biol. Chem.* **249**: 4781-4786 (1974).
13. Roberts, R.J. Staphylococcal transfer ribonucleic acids. II. Sequence analysis of tRNAGly/IA and tRNAGly/IB from *Staphylococcus epidermidis* Texas 26. *J. Biol. Chem.* **249**: 4787-4796 (1974).
14. Roberts, R.J., Arrand, J.R. and Keller, W. The length of the terminal repetition in adenovirus 2 DNA. *Proc. Natl. Acad. Sci. USA* **71**: 3829-3833 (1974).
15. Mulder, C., Arrand, J.R., Delius, H., Keller, W., Pettersson, U., Roberts, R.J. and Sharp, P.A. Cleavage maps of DNA from adenovirus types 2 and 5 by restriction endonuclease *Eco*RI and *Hpa*I. *Cold Spring Harbor Symp. Quant. Biol.* **39**: 397-400 (1974).
16. Arrand, J.R., Keller, W. and Roberts, R.J. Extent of terminal repetition in adenovirus-2 DNA. *Cold Spring Harbor Symp. Quant. Biol.* **39**: 401-407 (1974).

17. Roberts, R.J., Breitmeyer, J.B., Tabachnik, N.F. and Myers, P.A. A second specific endonuclease from *Haemophilus aegyptius*. *J. Mol. Biol.* **91**: 121-123 (1975).
18. Steenbergh, P.H., Sussenbach, J.S., Roberts, R.J. and Jansz, H.S. The 3'-terminal nucleotide sequences of adenovirus types 2 and 5 DNA. *J. Virol.* **15**: 268-272 (1975).
19. Sugden, B., DeTroy, B., Roberts, R.J. and Sambrook, J. Agarose slab gel electrophoresis equipment. *Anal. Biochem.* **68**: 36-46 (1975).
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21. Roberts, R.J., Myers, P.A., Morrison, A. and Murray, K. A specific endonuclease from *Haemophilus haemolyticus*. *J. Mol. Biol.* **103**: 199-208 (1976).
22. Godson, G.N. and Roberts, R.J. A catalogue of cleavages of Φ X174, S13, G4 and ST1 DNA by 26 different restriction endonucleases. *Virology* **73**: 561-567 (1976).
23. Roberts, R.J. Restriction and modification enzymes and their recognition sequences. In *Handbook of Biochemistry and Molecular Biology*, 3rd Edition, Nucleic Acids. Vol. II. 532-535 (1976).
24. Roberts, R.J. Restriction endonucleases. *CRC Critical Reviews in Biochemistry*, **4**: 123-164 (1976).
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26. Roberts, R.J., Wilson, G.A. and Young, F.E. Recognition sequence of specific endonuclease *BamHI* from *Bacillus amyloliquefaciens* H. *Nature* **265**: 82-84 (1977).
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34. Gelinas, R.E. and Roberts, R.J. One predominant 5'-undecanucleotide in adenovirus 2 late messenger RNAs. *Cell* **11**: 533-544 (1977).
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51. Roberts, R.J. Intervening sequences excised in vitro. *Nature* **274**: 530 (1978).
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54. Arrand, J.R. and Roberts, R.J. The nucleotide sequences at the termini of adenovirus-2 DNA. *J. Mol. Biol.* **128**: 577-594 (1979).
55. Zain, B.S. and Roberts, R.J. Sequences from the beginning of the fiber mRNA of adenovirus-2. *J. Mol. Biol.* **131**: 341-352 (1979).
56. Zain, B.S., Sambrook, J., Roberts, R.J., Keller, W., Fried, M. and Dunn, A.R. Nucleotide sequence analysis of the leader segments in cloned copy adenovirus-2 fiber mRNA. *Cell* **16**: 851-861 (1979).
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62. Roberts, R.J. Directory of Restriction Endonucleases. *Meth. Enzymol.* **68**: 27-41 (1979).
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68. Roberts, R.J. Restriction and modification enzymes and their recognition sequences. *Nucl. Acids Res.* **9**: r75-r96 (1981).

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73. Brooks, J.E. and Roberts, R.J. Modification profiles of bacterial genomes. *Nucl. Acids Res.* **10**: 913-934 (1982).
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77. Nucleases. (eds. S.M. Linn and R.J. Roberts). Cold Spring Harbor Laboratory, New York (1982) and (1985).
78. Gingeras, T.R., Blumenthal, R.M., Roberts, R.J. and Brooks, J.E. The isolation and characterization of the *E. coli* dam methylase gene. In, Metabolism and Enzymology of Nucleic Acids, (eds. J. Zelinka and J. Balan), Publishing House of the Slovak Academy of Sciences. p329-340 (1982).
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80. Roberts, R.J. Restriction Endonucleases. In, Nucleases, (ed. S.A. Linn and R.J. Roberts), p. 311-340. Cold Spring Harbor Laboratory. (1982)
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Dr. Richard J. Roberts is a Research Director at New England Biolabs, Beverly, Massachusetts. He was educated in England, attending St. Stephen's School and the City of Bath Boys' School in Bath before moving to the University of Sheffield where he obtained a B.Sc. in Chemistry in 1965 and a Ph.D. in Organic Chemistry in 1968. His postdoctoral research was carried out in Professor J.L. Strominger's laboratory at Harvard, where he studied the tRNAs that are involved in the biosynthesis of bacterial cell walls. From 1972 to 1992, he worked at Cold Spring Harbor Laboratory, reaching the position of Assistant Director for Research under Dr. J.D. Watson. He began work on the newly discovered Type II restriction enzymes in 1972 and in the next few years more than 100 such enzymes were discovered and characterized in Dr. Roberts' laboratory. His laboratory has cloned the genes for several restriction enzymes and their cognate methylases and studies of these enzymes has been a major research theme. Dr. Roberts has also been involved in studies of Adenovirus-2 beginning with studies of transcription that led to the discovery of split genes and mRNA splicing in 1977. This was followed by efforts to deduce the DNA sequence of the Adenovirus-2 genome and a complete sequence of 35,937 nucleotides was obtained. This latter project required the extensive use of computer methods, both for the assembly of the sequence and its subsequent analysis. His laboratory pioneered the application of computers in this area and the further development of computer methods of protein and nucleic acid sequence analysis continues to be a major research focus. The field of DNA methyltransferases is also an area of active research interest and crystal structures for the *Hha*I methyltransferase both alone and in complex with DNA have been obtained in collaboration with Dr. X. Cheng. The latter complex is quite remarkable as the protein causes the target cytosine base to flip completely out of the helix so that it is accessible for chemical reaction. This extreme, but elegant, distortion of the double helix had not been seen previously. A consuming interest at present is the semi-automatic identification of restriction enzyme and methylase genes within the GenBank database and the development of rapid methods to assay function. Already several new specificities have been found and it is clear that there are many more restriction enzyme genes in Nature than had been previously suspected.